

WHAT IS CLAIMED IS:

1. A catalyst for oxidizing and/or decomposing organic and/or inorganic oxidizable substances in waste water by wet oxidation with a use of a catalyst, comprising:

(i) activated carbon,

(ii) first component

wherein the first component is at least one selected from the group consisting of Ti, Zr, Hf, Nb, Ta, Fe, Co, Mn, Al, Si, Ga, Ge, Sc, Y, La, Ce, Pr, Mg, Ca, Sr, Ba, In, Sn, Sb and Bi; and

(iii) second component

wherein the second component is at least one selected from the group consisting of Pt, Pd, Rh, Ru, Ir and Au.

2. The catalyst according to claim 1, wherein a decrease value in a specific pore volume having 0.1 to 10 μ m pore diameter after the first component is deposited on the activated carbon is in the range from 0.01 to 0.5 ml/g compared with a specific pore volume thereof before the first component is deposited.

3. The catalyst according to claim 1, wherein a decrease value of a specific surface area after the first component is deposited on the activated carbon is in the range from 50 to 800 m^2/g compared with a specific surface area thereof before the first component is deposited.

4. A method of preparing a catalyst for oxidizing and/or decomposing organic and/or inorganic oxidizable substances in waste water by wet oxidation with a use of a catalyst, comprising the steps of :

- 1) depositing first component on an activated carbon wherein the first component is at least one selected from the group consisting of Ti, Zr, Hf, Nb, Ta, Fe, Co, Mn, Al, Si, Ga, Ge, Sc, Y, La, Ce, Pr, Mg, Ca, Sr, Ba, In, Sn, Sb and Bi; and
- 2) depositing second component on the activated carbon wherein the second component is at least one selected from the group consisting of Pt, Pd, Rh, Ru, Ir and Au.

5. A method for oxidizing and/or decomposing organic and/or inorganic oxidizable substances in waste water by wet oxidation with a use of a catalyst, wherein

the oxidizable substances are oxidized and/or decomposed with an oxygen containing gas in the presence of the catalyst under pressure such that said waste water retains the liquid phase thereof at temperature of 50 to less than 170°C and the catalyst contains activated carbon; and
an oxygen concentration in an exhaust gas is controlled in the range of 0 to 5 vol%.

6. The method according to claim 5, wherein the catalyst

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further contains at least one selected from the group consisting of Pt, Pd, Rh, Ru, Ir and Au.

7. The method according to claim 5, wherein the catalyst further contains at least one selected from the group consisting of Ti, Zr, Hf, Nb, Ta, Fe, Co, Mn, Al, Si, Ga, Ge, Sc, Y, La, Ce, Pr, Mg, Ca, Sr, Ba, In, Sn, Sb and Bi.

8. The method according to claim 7, wherein a decrease value of a specific pore volume having 0.1 to 10 μ m pore diameter after at least one element selected from the group in claim 7 is deposited on the activated carbon is in the range from 0.01 to 0.5 ml/g compared with a specific pore volume thereof before the element is deposited.

9. The method according to claim 7, wherein a decrease value of a specific surface area after at least one element selected from the group in claim 7 is deposited on the activated carbon is in the range from 50 to 800 m^2/g compared with a specific surface area thereof before the element is deposited.

10. The method according to claim 5, wherein a supply amount of the oxygen containing gas is controlled to obtain
$$\frac{[\text{oxygen amount in the oxygen containing gas supplied}]}{[\text{oxygen demand of the waste water at maximum waste water treatment efficiency}]} = \text{in the range from 0.8 to 1.3.}$$

11. The method according to claim 5, wherein the oxygen containing gas and the waste water descend concurrently at the catalyst.

12. The method according to claim 5, wherein the oxygen containing gas is supplied from at least two location by dividing the total amount of the oxygen containing gas.

13. A method for oxidizing and/or decomposing organic and/or inorganic oxidizable substances in waste water by wet oxidation with a use of a catalyst, wherein

the oxidizable substances are oxidized and/or decomposed with an oxygen containing gas in the presence of a catalyst under pressure such that said waste water retains the liquid phase thereof at temperature of 50 to less than 170°C and the catalyst contains activated carbon; and

supplying a catalyst protection liquid which contains easily decomposable substances at the time of temperature rising when starting up a operation of the wet oxidation and/or at the time of temperature lowering when suspending the operation.

14. The method according to claim 13, wherein a supply amount of the catalyst protection liquid is controlled so as to the easily decomposable substances in the protection liquid is remained in a liquid passed through the catalyst.

15. The method according to claim 13, wherein a temperature

during the catalyst protection liquid is supplied is lower than a temperature during the waste water is treated.

16. The method according to claim 13, wherein an oxygen concentration in an exhaust gas is controlled in the range from 0 to 5 vol% at the time of temperature rising when starting up a operation of the wet oxidation and/or at the time of temperature lowering when suspending the operation.

17. The method according to claim 13, wherein a supply amount of an oxygen containing gas or an oxygen uncontainig gas is controlled to obtain $[\text{oxygen amount in the gas supplied}]/[\text{oxygen demand in the protection liquid at maximum catalyst protecting efficiency}] =$ in the range from 0 to 1.3 at the time when supplying the catalyst protection liquid to the catalyst.

18. A method for oxidizing and/or decomposing organic and/or inorganic oxidizable substances in waste water by wet oxidation with a use of a catalyst, wherein

the oxidizable substances are oxidized and/or decomposed with an oxygen containing gas in the presence of a catalyst under pressure such that said waste water retains the liquid phase thereof at temperature of 50 to less than 170°C;

the catalyst contains activated carbon; and

supplying a catalyst recovering liquid which contains easily decomposable substances to the catalyst under temperatures in the range from 55°C to less than 200°C.

19. The method according to claim 18, wherein a supply amount of the catalyst recovering liquid is controlled so as to the easily decomposable substances in the recovering liquid is remained in a liquid passed through the catalyst.

20. The method according to claim 18, wherein a supply amount of an oxygen containing gas or an oxygen uncontainig gas is controlled to obtain $\frac{\text{[oxygen amount in the gas supplied]}}{\text{[oxygen demand in the recovering liquid at maximum catalyst recovering efficiency]}}$ = in the range from 0 to 1.3 at the time when supplying the catalyst recovering liquid to the catalyst.